

Marshall Space Flight Center

June 14, 2001

Opening a new X-ray window to the universe

Marshall scientists capture historic, first focused high-energy X-ray images of astronomical objects



Marshall Center photo

Dr. Brian Ramsey, lead scientist for the High Energy Replicated Optics project at Marshall, installs the mirrors that in May 2001 collected the world's first focused high-energy X-ray images of any astronomical object.

by Sherrie Super

sing a telescope containing unique X-ray mirrors, a team from the Marshall Center has obtained the world's first focused high-energy X-ray images of any astronomical object.

"This is the first step toward opening the high-energy, or 'hard,' X-ray spectrum for high sensitivity exploration," said Dr. Brian Ramsey, lead scientist for the High Energy Replicated Optics (HERO) project. "Every time a new wavelength region of the electromagnetic spectrum is opened with more sensitive instruments there are surprises and new discoveries. Until now, the only images obtained in this spectral region have been collected by non-focusing detectors with much lower sensitivity."

Focusing — concentrating the X-rays onto a very small area of a detector, such as a telescope does — prevents the signal from being overwhelmed by the background noise. This has never been accomplished in observations of the high-energy X-ray

See X-ray Images on page 5

Marshall's Robert Hughes to lead X-43A mishap investigation board

NASA release

arshall's Robert Hughes has been named chairman of the X-43A mishap investigation board convened last week by NASA to determine the cause of loss of the first X-43A unpiloted hypersonic research aircraft.

Gathering at NASA's Dryden Flight Research Center, Edwards Calif., the board consists of members from other NASA Centers, including:

- John J. Deily, Goddard Space Flight Center, Greenbelt, Md.
- Joseph J. Lackovich Jr., Kennedy Space Center, Fla.
- Victoria A. Regenie, Dryden Flight Research Center
 - Luat T. Nguyen, Langley Research

Center, Hampton, Va.

The mated X-43A and its booster rocket went out of control about eight seconds after ignition of the Pegasus motor during the June 2 launch over the Pacific Ocean off the California coast.

The booster was intentionally destroyed using onboard flight-termination explosives, and fell safely in a cleared Navy sea range. There were no injuries and no damage to other aircraft or property.

This mission was the first of three flights to demonstrate an airframeintegrated, "air-breathing" propulsion system design, called a scramjet, which so far has only been tested in ground facilities, such as wind tunnels.

Inside the Star

- STS-102 crew visits Marshall Thursday, page 2
- Safety Bowl questions, page 3
- Lightning Awareness Week is June 18-22, page 4
- 'Fires of Kuwait' opens Friday at Space & Rocket Center, page 5
- Knowing how to swim essential to staying safe, page 6

Shuttle mission STS-102 crew visits Marshall Thursday

he STS-102 crew plans to visit
Marshall Thursday for a debrief of
their mission. This crew took the
Italian Multi-Purpose Logistics Module,
Leonardo, to the International Space
Station.

The STS-102 mission also marked the

first crew exchange for the International Space Station. The Expedition 2 crew was delivered to the Space Station and Expedition 1 crew was returned to Earth.

Space Shuttle crewmembers visiting Marshall are Commander James Wetherbee; pilot James Kelly; and mission specialists Andrew Thomas and Paul Richards.

The crew will present mission highlights in Morris Auditorium at 10:30 a.m. All civil service and contractor employees are invited to attend, and should plan to be seated by 10:15. Bus transportation to Bldg. 4200 will be provided every 15 minutes beginning at 9:45 a.m.



NASA photo

STS-102 astronauts, from left, James Wetherbee, James Kelly, Paul Richards and Andrew Thomas walk from a training site in the Systems Integration Facility to another locale as they prepare for their trip to the Space Station.

Bus 1

Bldg. 4705, south side entrance Bldg. 4708, northeast entrance Bldg. 4707, north entrance Bldg. 4755, main entrance

Bus 2

Bldg. 4610, north side entrance Bldg. 4612, west side entrance

Bus 3

Bldg. 4487, main entrance Bldg. 4471, east entrance

Van 1

Bldg. 4481, west end entrance Bldg. 4493, main entrance

Van 2

Bldg. 4666, main entrance, north side

Van 3

Bldg. 4663, main entrance, northeast corner BAC Trailers, main entrance

Children of NASA employees earn scholarships

NASA release

his year's winners of the NASA College Scholarship Fund are:

- Linda Hung, daughter of Glenn Research Center employee, Ching-cheh Hung;
- Sarah H. Zaman, daughter of Glenn Research Center employee, Khairul Zaman;
- Christopher R. Malow, son of Glenn Research Center employee, Deborah S. Malow;
- Bobbie G. Chern, son of Goddard Space Flight Center employee, Engmin J. Chern;
- Nicholas A. Singhal, son of Johnson Space Center employee, Anil K. Singhal;
- Saini Swati, daughter of Ames Research Center employee, Subhash Swati; and
- Jyothi M. Natarajan, daughter of Langley Research Center employee, Murali Natarajan.

This brings the total number of recipients to 97, of which 61 have graduated.

This year, the Scholarship Fund will be included in all Combined Federal Campaigns as a National Unaffiliated Agency—identification number 1038. More than \$10,000 was received from CFC programs across NASA in 2001. These contributions help to make it possible to award merit scholarships in the future.

The NASA College Scholarship Fund Inc. board of directors has determined that six scholarships will be awarded next year. Each scholarship will be renewable annually for a maximum of \$8,000 over six calendar years.

The Scholarship Fund was established to award scholarships Agencywide to qualified dependents of NASA and former NASA employees. The fund was established as a direct result of a substantial unsolicited gift by the noted Pulitzer Prize winning author, James A. Michener. Many NASA employees have contributed to the fund directly or through the Combined Federal Campaign. Other major contributors include the Freedom Forum to honor the Hubble crew members in 1994, and again in 1997 to honor Shannon Lucid, and the Johnson Space Center and Kennedy Space Center Chapters of the NASA Alumni League.

MARSHALL STAR

June 14, 2001

Star factory near galactic center bathed in high-energy X-rays

Marshall release

ear the crowded core of the Milky Way galaxy, where stars shine so brightly and plentifully that planets there would never experience nighttime, astronomers have found a new phenomenon: a cauldron of 60-million-degree gas enveloping a cluster of young stars.

Professor Farhad Zadeh of Northwestern University and his collaborators used the Marshall-managed Chandra X-ray Observatory to trace the gas around the Arches cluster, a well-studied region of star formation that is home to some of our Galaxy's largest and youngest stars.

"This is the first time we have seen a young cluster of stars surrounded by such a halo of high-energy X-rays," said Zadeh in a press conference at the American Astronomical Society in Pasadena, Calif. "This supports theoretical predictions that stellar winds from massive stars can collide with each other and generate very hot gas."

Massive stars, newborn stars and stellar winds have long been known to emit X-rays. The Chandra results are significant because they identify this new type of mechanism of colliding winds to generate X-rays. These X-rays are as energetic as those seen in distant starburst galaxies, which are known for their furious pace of star production.

The Arches cluster is about 25,000 light years from Earth and only about 1 to 2 million years old. It is also less than 100 light years from what is thought to be a supermassive black hole in the center of our Galaxy. The cluster contains 150 hot, young stars, known as "O" stars, concentrated within a diameter of one light year, making it the most compact cluster known in the Milky Way galaxy.

The density of stars makes the region in and around the Arches cluster a microcosm of what is likely occurring in starburst galaxies. "The Arches cluster is one of the best 'local' analogues of starburst galaxies — the most prodigious stellar nurseries known," said Casey Law of the Harvard-Smithsonian Center for Astrophysics. "Yet the Arches cluster is in our backyard, not millions of light years away."

Chandra observed Arches cluster region with its Advanced CCD Imaging Spectrometer (ACIS). The research team for this investigation also included Casey Law and Antonella Fruscione from the Harvard-Smithsonian Center for Astrophysics; Cornelia Lang and Daniel Wang from University of Massachusetts; Mark Wardle of the University of Sydney, Australia; and Angela Cotera from University of Arizona.

The ACIS X-ray camera was developed for NASA by Penn State and MIT. TRW, Inc., Redondo Beach, Calif., is the prime contractor for the spacecraft. The Smithsonian's Chandra X-ray Center controls science and flight operations from Cambridge, Mass.

Images associated with this release are available on the Web at: http://chandra.harvard.edu and http://chandra.nasa.gov

2001 Safety Bowl

from Marshall's Safety Office

ere's an additional set of questions to be reviewed for Marshall's 2001 Safety Bowl being held in September. Be sure to check "Inside Marshall" for more questions.

- 1. Closure of a safety finding requires:
 - A. Closure plan acceptable to building manager
 - B. Approval of initiator
 - C. Submittal of Work Order
 - D. Correction of unsafe condition
- 2. A condition that could cause injury, illness or death is called:
 - A. Mishap
 - B. Near miss
 - C. Close call
 - D. Hazard
- 3. True or False: Slower is better when doing crunches so one utilizes the muscle(s) and momentum.
- 4. True or False: Stress always causes people to eat more food than their bodies need.
- 5. True or False: The Silver Snoopy Award is one of the methods used to recognize those who have contributed to Marshall's Safety Program.
- 6. Safety meeting attendees' signatures and meeting minutes are recorded and kept on file for how long?
 - A. 3 years
 - B. 5 years
 - C. 2 years
 - D. 6 months
- 7. True or False: Setting priorities, avoiding high-risk situations and deep breathing are all techniques that will help in handling stress.
- 8. In terms of safety, what is "safety halt or stop work authority?"
- 9. Before welding or grinding, you should contact the Safety Office to obtain what?
- 10. What are the four elements of NASA's safety hierarchy, as established by the Agency Safety Initiative?

June 14, 2001 MARSHALL STAR

June 18-22 is National Lightning Safety Awareness Week

from the National Weather Service ational Lightning Safety Awareness Week is being observed June 18-22.

Lightning is the No. 2 weather killer in the United States — killing more people than hurricanes and tornadoes combined. Lightning also inflicts severe lifelong injuries on many more than it kills.

While nothing offers absolute safety from lightning, some actions can greatly reduce your risks. Two very important things to remember about lightning safety are:

- No place outside is safe near a thunderstorm
- Use the 30/30 rule to determine when to seek shelter before dangerous lightning approaches

30/30 rule

The 30/30 lightning safety rule says: Go indoors if, after seeing lightning, you cannot count to 30 before hearing thunder. Stay indoors for 30 minutes after hearing the last clap of thunder.

How lightning forms

Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas. Rising and descending air within a thunderstorm separates these positive and negative charges. Water and ice particles also affect charge distribution.

A cloud-to-ground lightning strike begins as an invisible channel of electrically charged air moving from the cloud toward the ground. When one channel nears an object on the ground, a powerful surge of electricity from the ground moves upward to the clouds and produces the visible lightning strike.

Lightning facts

- Lightning causes an average of 80 fatalities and 300 injuries each year.
 - Lightning occurs in all thunder-



car will protect you from being struck by lightning. **TRUTH:** Rubber-soled shoes and rubber tires provide NO protection from lightning. The steel frame of a hard-topped vehicle provides increased protection if you are not touching metal. Although you may

be injured if lightning

strikes your car, you are

much safer inside a vehicle

no danger from lightning.

TRUTH: Lightning often

and may occur as far as 10

rainfall. This is especially

true in the western United

sometimes produce very

MYTH: The rubber soles

of shoes or rubber tires on a

little rain.

States where thunderstorms

miles away from any

strikes outside of heavy rain

storms; each year lightning strikes the Earth 20 million times.

- The energy from one lightning flash could light a 100-watt bulb for more than three months.
- Most lightning fatalities and injuries occur when people are caught outdoors in the summer months during the afternoon and evening.
- Lightning can occur from cloud-tocloud, within a cloud, cloud-to-ground, or cloud-to-air.
- Many fires in the western United
 States and Alaska are started by lightning.
- The air near a lightning strike is heated to 50,000 degrees F hotter than the surface of the Sun. The rapid heating and cooling of the air near the lightning channel causes a shock wave that results in thunder.

Lightning myths and truths

MYTH: If it is not raining, then there is

MYTH: People struck by lightning carry an electrical charge and should not be touched.

than outside.

TRUTH: Lightning-strike victims carry no electrical charge and should be attended to immediately. Contact your local American Red Cross chapter for information on CPR and first aid classes.

MYTH: "Heat lightning" occurs after very hot summer days and poses no threat.

TRUTH: "Heat lightning" is a term used to describe lightning from a thunderstorm too far away for thunder to be heard.

For more information on lightning and lightning safety, visit the Web at: http://www.lightningsafety.noaa.gov

MARSHALL STAR
June 14, 2001



Photo by Doug Stoffer, NASA/Marshall Space Flight Center

Center Director briefs retirees, contractors

Center Director Art Stephenson, center, talks to Dr. William Lucas, former Marshall Center Director, left, and James Murphy at the Marshall Retiree Association briefing held at the Marshall Center on June 8. Earlier that day, Stephenson also spoke with contractors at the Center Director's breakfast.

'Fires of Kuwait' opens Friday

he U.S. Space & Rocket Center will show "Fires of Kuwait" from Friday through July 15 at the Spacedome IMAX Theater.

"Fires of Kuwait" follows a team of Texas fire fighters as they battle the raging Kuwaiti oil well fires in the fall of 1991 in the aftermath of the Gulf War. Released in 1992, the film was nominated for an Academy Award in the Best Feature Documentary Category. It first appeared at the Spacedome Theater in 1993.

Showtimes are 9:30 a.m., 1 p.m. and 4:40 p.m. with Friday and Saturday night showings at 8 p.m.

Tickets to the Space & Rocket Center are \$14.95 for adults and \$10.95 for children and include one Spacedome movie. Spacedome tickets purchased separately are \$6.50 for adults and \$5.50 for children.

X-ray Images

Continued from page 1 spectrum, until now.

"The ability to collect focused hard X-ray images has the potential of allowing us to observe objects in the heavens which are 10 to 100 times fainter than those which can be detected with current instruments," Ramsey said. "This development gives us new eyes – enabling new understanding about our violent universe."

The HERO team launched the experimental telescope May 23 from Fort Sumner, N.M., using a 40 million cubic-foot (1.1 million cubic-meter) balloon that carried the payload to an altitude of 128,000 feet (39,000 meters). At this altitude, the telescope is above 99.7 percent of Earth's atmosphere, which absorbs X-rays and many other wavelengths of electromagnetic radiation.

During its 24-hour flight, Ramsey and his team used the telescope to study cosmic X-ray sources including the Crab Nebula and the Cygnus X-1 binary star system.

The telescope collected the images using six X-ray reflecting mirrors fabricated at the Marshall Center. The mirrors, a special type called "grazing incidence," are nested cylinders with extremely smooth inner surfaces that reflect high-energy X-rays at very shallow angles.

The mirrors were made with a replication technique using a special nickel alloy developed at the Marshall Center. Replication employs reusable forms, called mandrels, to make telescope

mirrors that require no final finishing. With replication, multiple mirror shells can be made from a single master. Without replication, X-ray mirrors must be custom-made, one at a time.

Since the 1970s, X-ray telescopes have collected images at low X-ray energies, sometimes called "soft" X-rays. The most sensitive soft-X-ray telescope is NASA's Chandra X-ray Observatory, managed by the Marshall Center.

"This is an historic breakthrough," said Martin Weisskopf, project scientist for Chandra. "Collecting the very first focused hard X-ray images of cosmic X-ray sources is an exciting milestone for X-ray astronomy as a whole."

The full planned HERO science payload, scheduled for completion in 2003, will consist of 240 mirrors, which will provide approximately 50 times greater sensitivity than this year's proof-of-concept mission. The HERO project has been funded by NASA's Office of Space Science in Washington, D.C.

The HERO payload was built in house at the Marshall Center. Jeffery Apple of Marshall's Science Systems Department is the lead engineer. Marshall's Space Science Department, Science Systems Department, and Space Optics Manufacturing and Technology Center together with the University of Alabama in Huntsville and Raytheon ITSS in Lanham, Md., all contributed to this success.

The writer, employed by ASRI, supports the Media Relations Department.

June 14, 2001 MARSHALL STAR

Knowing how to swim essential to staying safe

from Marshall's Safety Office

earn to swim. The best thing anyone can do to stay safe in and around the water is to learn to swim.

The American Red Cross has swimming courses for people of any age and swimming ability. Contact the local Red Cross chapter for information on courses.

If swimming in the ocean, remember the following:

- Stay within the designated swimming area, ideally within the visibility of a lifeguard.
 - Never swim alone.
 - Check the surf conditions before entering the water.
- Check to see if a warning flag is up or check with a lifeguard for water conditions, beach conditions or any potential hazards.
- Stay away from piers, pilings and diving platforms when in the water.
- Keep a lookout for aquatic life. Water plants and animals may be dangerous. Avoid patches of plants. Leave animals alone.
- Make sure to always have enough energy to swim back to shore.
- Don't try to swim against a current if caught in one. Swim gradually out of the current, by swimming across it.

Redstone Recreation Center offers tours to local attractions

Redstone Recreation Center tours are open to the entire Redstone and NASA communities. Family members and guests are also welcome.

Tours leave from the Recreation Center, Bldg. 3711. For more information, call Wednesday through Friday after 1:30 p.m. or from 10 a.m.-6 p.m. weekends at 876-4531.

- An **RC** and Moonpie Festival will be held June 16 in Bell Buckle, Tenn. All seats cost \$12. The bus departs at 7:30 a.m. and returns at 6 p.m. The tiny town of Bell Buckle is just a little eccentric. Once a year they have a fling to celebrate the mystical, delicious and very southern Moonpie. You never know what kind of antics they will be up to, but there will be plenty of arts & crafts vendors, food and merryment.
- On June 30, the Recreation Center will sponsor a tour to **Graceland** in Memphis. Cost is \$38. The bus departs at 6 a.m. and returns at 9 p.m. The home of Elvis Presley, the King of Rock & Roll. It's all there report cards, the pink Cadillac, his Army uniform, gold records, Pricilla's wedding dress, his planes and tour bus. You don't have to be a fan to be amazed.
- In July, travel to Loony's Tavern in Double Springs, Ala., to see "Daddy's Dyin', Who's Got The Will?" Cost is \$30. The bus departs at 4 p.m. July 14 and returns at midnight. We will visit with the Turnover family at the Dual Destiny Theater while they visit daddy on his deathbed. They are a pretty rowdy bunch, so this play is rated PG13. Price includes a down home, hill country buffet at Sister Sara's Kitchen on the Loony's Tavern Complex.



Photo by Doug Stoffer, NASA/Marshall Space Flight Center

NASA associate administrator for public affairs visits Marshall

Tereasa Washington, right, director of Marshall's Customer and Employee Relations Directorate, presents Jerry Brown, left, NASA's associate administrator for public affairs, with a model of the X-37, a Marshallmanaged program, in recognition of his visit to the Marshall Center June 4-6.

MARSHALL STAR June 14, 2001

Center Announcements

Blood Drive

The American Red Cross will hold a ■ blood drive Friday in the NASA Exchange, Bldg. 4752. All blood types are urgently needed. Those whose last names begin with A-B should donate at 8 a.m.; C-F, 8:30 a.m.; G-H, 9 a.m.; I-L, 9:30 a.m.; M-P, 10 a.m.; Q-S, 10:30 a.m.; and T-Z, 11 a.m. All donors will receive a gift certificate for a free, medium, onetopping Domino's pizza. Anyone who cannot attend this Blood Drive but wishes to participate, can donate at The American Red Cross, 1101 Washington Street, Monday through Thursday, 10 a.m.-5:30 p.m., or Friday 8 a.m.-1 p.m.

AIAA Awards dinner

S. Rep. Robert Aderholt of Alabama will speak at the American Institute of Aeronautics and Astronautics (AIAA) 49th Annual Installation and Awards Dinner at 6 p.m. June 22 at the Von Braun Center. Cost for the event is \$20 each (\$10 for full-time students). Make reservations by 4 p.m. June 19 to Dr. Arloe Mayne at 881-7124 or e-mail to: ArloeWJr.@cs.com

Clubs and Meetings

Genealogical Society meets

he Huntsville Genealogical Computl ing Society will meet at 7 p.m. June 18 in the auditorium of the Huntsville-Madison County Public Library on Monroe Street. Visitors are welcome, and reservations are not required. The program on Civil War research will be led by Professor Robert S. Davis Jr. of Wallace State Community College in Hanceville.

Shuttle Buddies meet

The Shuttle Buddies will meet for breakfast at 9 a.m. June 25 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757 or Gail Wynn at 852-8189.

Sports

Fishing results

arrel Simonds and Ken Anthony caught five fish weighing a total of 11.36 pounds to take first place in the June 9 fishing tournament at Browns Creek. Tim Smith caught five fish at 10.96

Answers –

Continued from page 3

Answers to this week's Safety Bowl questions are:

- 1. D. Correction of unsafe condition
- 2. D. Hazard
- 3. True
- 4. False
- 5. True
- 6. A. 3 years
- 7. True
- 8. The authority to stop an operation if an unsafe act or condition exists.
- 9. A "Hot Work" Permit
- 10. Safety of the public, astronauts and pilots, employees and high value equipment.

pounds for second place. Charles Cothran and Glenn Batchelor finished in third with three fish weighing 6.39 pounds. Alex Rawleigh snagged big fish honors with a 3.36-pound Largemouth Bass. The next tournament is a buddy/night tournament July 13 at Wheeler/1st Creek. For more information, call 544-9073 or 544-6367.

Education Programs Department says thanks to SHARP mentors

he Education Programs Department would like to thank the following people for taking time out of their busy schedules to mentor a SHARP student for nine weeks this summer.

Andy Welch, AD42

Chris Bramon, FD01

Monsi Roman, FD21

Dan Gunter, FD30

Nate Boclair, FD43

Hossin Abdeldayem, SD47

James H. Adams, SD50

Gary Jedlovec, SD60

Claude Irvine, TD40

Richard Stroud, TD62

Mike Houts, TD40

Randy McNichol, ED17

Linda Brewster, ED19

Karen Oliver, ED21

James L. Walker, ED32

Tom DeLay, ED34

Dawn Cross Stanley, ED36

Jeneene Sams, ED36

Danny Garcia, ED41

Mariea Dunn, ED42

Thad Henry, ED43

Jena Hughey, ED43

Tony Clark, ED44

Scott Schutzenhofer, MP71

Jose Sanchez, MP71

Dennis Davis, QS10

Obituaries

Monks, Leonard D., 59, of Huntsville, died June 3. He retired from Marshall in 1999, where he was a distribution facilities specialist.

Hooper, Albert W., 96, of Huntsville, died June 1. He retired from Marshall in 1969 where he worked as an engineer in technical management.

Sainker, Irving S., 67, of Huntsville died May 29. He retired from Marshall in 1995 where he worked as an electronics engineer. He is survived by his wife, Eidele L. Sainker.

Employee Ads

Miscellaneous

- ★ Dirt Devil mop/vac, extra battery w/ charger, \$40. (256) 931-4678
- Utility trailer w/tilt bed, 8'x4', \$250. 232-
- HGH, 11 week's supply, \$105. 539-7654
- White twin bed w/drawers underneath. 852-2145
- ★ Presto cooker-canner, holds 7 quarts, \$25; canning jars, quart size 20 cents each, pint size 10 cents each. 883-5046
- ★ 1991 Honda CM400T motorcycle, red, 700 miles, original owner, windshield, \$1,200 firm. 883-5955
- ★ Solid wood bunk bed w/mattresses, fullsize bottom, twin size top, \$125. 828-5077
- "Duty Calls," rare LE print by Civil War artist Don Stivers, signed, #25/1000, w/ COA, \$700. 864-0221
- Solid oak cherry stained dining table, 12' long, 12 chairs. 539-9777
- Monkey grass (Liriope), solid green leaves, \$1 per plant. 426-4325
- Dutch Masters Cameron Elite cigars, 5 boxes, 50 per box, \$20 per box. 682-3158
- Maternity clothes, nursing tops, Medela Pump-in-Style breast pump. 880-2290
- Medela Pump-in-Style breast pump, like new, \$130. Graco swing, variable speeds, \$40. 721-2239
- Total Body elliptical exerciser, computerized, measures fat, calories, distance, etc. 430-3413/Charlie Cox after 6 p.m.
- Telephoto and wide angle camera lens collection for 35mm camera. 325-6000
- Couch/love seat, beige/green/terra cotta brocade, 1 yr. old, \$675 obo. 830-5125
- 1996 Evinrude outboard motor, 6HP, two stroke, less than 20 hrs., \$700. 739-7554/
- Kitchen table, solid wood w/six chairs, \$200 obo; 1.5 year old cherry claw-foot coffee table, \$75 obo. 509-3392
- Brunswick pool table, Paragon oak w/ cherry finish, navy blue felt, 1" slate drop leather pockets, all accessories, \$2,000. 509-3392
- ★ AB roller, \$25. 233-1993
- ★ Four Michelin 195/60R15 MXV4 tires, \$15

each; dog shock collar, bark activated, \$50. 230-6846

Vehicles

- ★ 1995 Honda EX, 89K miles, white, 5speed, new tires, keyless entry, 4-door, \$9,895 obo. (256) 582-5210
- ★ International tractor, Model 574, 52HP gas engine, roll-cage, power-steering, new rear hydraulics, 5' bush hog, \$4,700. 778-9149/ Dave
- ★ 1997 Chevrolet Cheyenne C1500, 4.3/V-6, auto, 120K highway miles, short bed, no dents, \$7,950. (256) 753-2278
- ★ 1993 Chevrolet Silverado K5 blazer, blue/ white, V-8, \$2,400 obo. 232-9439
- ★ 1996 Ford Ranger, 5-speed, toolbox, good tires, 83K miles, \$5,200; 1981 Dodge D-150, slant 6, 4-speed, \$2,500. 423-4877
- ★ 1992 Mitsubishi 300 GT, white, 5-speed, AM/FM/CD, leather, sunroof, 73K miles, \$8,900 obo. 880-6086
- ★ 1996 Chevy Astro van, PW/PL, AM/FM/ CD/Cass., dual-air, cruise, 100K miles, \$8,500. 882-5511
- ★ 1999 Mercury Cougar, red, auto, keyless entry, 29K miles, \$12,500 obo. 772-1821/ 714-5504
- ★ 2001 Chevy LS Blazer, 2WD, 2-door, pewter w/gray cloth interior, 16K miles, one-owner, \$18,000 obo. 306-0232
- ★ 1989 Nissan Stanza GXE, auto, no air, runs, needs transmission or buy for parts. 614-0044
- ★ 1996 Explorer XLT, V-8, leather, white/gray interior, \$9,200. 881-6094
- ★ 1999 Geo Tracker, silver, 4WD, 25K miles. 355-6116
- ★ 1996 Chevy Blazer LT, 4WD, auto, CD, leather, new Michelins, 60K miles, \$11,500. 658-6183
- ★ 1969 Camaro, all items new, needs paint & upholstery, 400 SB, 4-speed Muncie, 3.73 rear-end, \$9,000 obo. 509-3392
- 1995 Chevy Astro eight-passenger van, 112K miles, many extras, \$6,300. 721-2239
- ★ 1984 Ford Thunderbird, 5-speed turbo, A/C, PS, PB, extra wheels and taillights, 150K miles, \$700 obo. 883-5396.

Wanted

- ★ Black leather winter jacket for tall man w/ medium build, in excellent-good condition. 759-7679
- Small metal storage building, approximately 40-60 square feet size. 534-4968
- Late model, low-mileage Toyota Camry. (931) 732-4742

Found

- ★ Small blue beeper, Bldg. 4201 parking lot. Call 544-3818 to identify/claim
- Bracelet in parking lot of Bldg. 4487. call 544-3530 to identify

Lost

★ Pen, gold trim, white deer horn body, Bldg. 4203 conference rooms, sentimental value. Call 544-0573 if found.

Free

- ★ Kittens, black & white, tiger, 12-weeks, all shots, no reptile owners or re-sellers. 776-
- ★ Cat, 2 yrs. old, smoke, female, healthy, playful, well-behaved. (931) 433-5087

To thank you

would like to thank all those who sent their thoughts and prayers while I was out with my mother's illness and during my surgery. Your time donated was greatly appreciated and may God bless each of you.

- Rita Keith, SD70

MARSHALL STAR

Vol. 41/No.39

Marshall Space Flight Center, Alabama 35812 (256) 544-0030

http://www1.msfc.nasa.gov

The Marshall Star is published every Thursday by the Internal Relations and Communications Department at the George C. Marshall Space Flight Center, National Aeronautics and Space Administration. Contributions should be submitted no later than Monday noon to the Marshall Internal Relations and Communications Department (CD40), Bldg. 4200, room 101. Submissions should be written legibly and include the originator's name. Send electronic mail submissions to: intercom@msfc.nasa.gov The Marshall Star does not publish commercial advertising of any kind.

> Manager of Internal Relations and Communications — Robert Champion Editor — Debra Valine

U.S. Government Printing Office 2001-633-095-20052

PRE-SORT STANDARD Postage & Fees PAID NASA Permit No. G-27